OISHEE BINTEY HOQUE

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EDUCATION

PhD in Computer Science, *University of Virginia* **|** *Charlottesville, VA*   *August 2021 - July 2026(Expected)*
Relevant Courses: Machine Learning (ML), ML in Image Processing, Interpretable ML, NLP, 3D Computer Vision
BSc in Computer Science, *Ahsanullah University of Science and Technology | Dhaka, Bangladesh*   *Aug* 2019

SELECTED RESEARCH PUBLICATIONS

[1] ***Oishee Bintey Hoque; et al.***, *"IGraSS: Learning to Identify Infrastructure Networks from Satellite Imagery by Iterative Graph-constrained Semantic Segmentation**", Under Review, 2024*

[2] ***Oishee Bintey Hoque; et al***., **"**IrrNet: Advancing Irrigation Mapping with Incremental Patch Size Training on Remote Sensing Imagery", **V4A, CVPR, 2024**

[3] ***Oishee Bintey Hoque; et al***., "COVID-19 non-pharmaceutical interventions: data annotation for rapidly changing local policy information", **Scientific Data - Nature**, **2023**

[4] Sifat Ahmed, Tonmoy Hossain, ***Oishee Bintey Hoque***, *et al*., "Automated COVID-19 Detection from Chest X-Ray Images: A High-Resolution Network (HRNet) Approach", SN Computer Science. 2021

[5] ***Oishee Bintey Hoque***; *et al*., "BdSL36: A Dataset for Bangladeshi Sign Letters Recognition", **ACCV Workshops, 2020**

[6] ***Oishee Bintey Hoque***, *et al*., "Real Time Bangladeshi Sign Language Detection using Faster R-CNN", **ICIET, 2018**

RESEARCH EXPERIENCE

Graduate Research Assistant, *University of Virginia*   *Aug 2021 – Present*
Tech Stack: Python, Tensorflow, Pandas, Rasterio, NumPy, Matplotlib, scikit-learn, OpenCV, QGIS, Jupyter Notebooks

Identify Infrastructure Networks from Satellite Imagery by Iterative Graph-constrained Semantic Segmentation
- Built a data-driven framework that integrates **learning with optimization/constraint satisfaction** and **graph analysis algorithms** using pseudo-labels, iteratively improving ground truth network by connecting gaps
- Introduced new evaluation metrics that **account for neighborhood (r) considerations** to address **issues** with **single-pixel precision** in annotations, allowing for small spatial discrepancies between predictions and GT.
- Conducted extensive experiments with **two types of networks and global constraints**, achieving **~5% performance improvement** in canal network identification and road network identification from satellite images

Knowledge Guided Segmentation from Remote Sensing Data utilizing different Scales and Multimodality
- Developing a deep learning system to identify different assets from remote sensing imageries
- Building a pipeline to integrate scale variance and multimodal information in low-data setting

PROFESSIONAL EXPERIENCE

Research Intern, *USDA-NIFA/NSF AI Institute for Next Generation Food Systems (AIFS)*   *Jun 2023 – August 2023*
- Prepared a geospatial data processing pipeline, ensuring compatibility with various deep learning architectures.
- Trained and evaluated multiple segmentation models to detect various irrigation types from remote sensing data
- Developed a model incorporating incremental patch size based training to better understand the fine features
- Identified the most effective channels and utilized multi-channel information during model training
- Achieved approximately **10% improvement in segmentation** results compared to state-of-the-art models

Software Engineer, *Enosis Solutions***,** *Dhaka, Bangladesh*   *Aug 2020 – Jul 2021*
Tech Stack: C#, JS, SQL (MySQL, Oracle), MongoDB, React.js, Node.js, Express.js, MVC Framework, Git, Visual Studio, Jira
- Implemented and updated several features of an Incident Management Tool which tracks different occurrences of an organization using C# and MVC Framework
- Designed and developed the full stack implementation of a web platform to train/test Machine Learning models.

EXTRA CURRICULAR ACTIVITIES

- Achieved **3rd Position** in **2023 AgAID Digital AgAth0n**
- Solved algorithmic problems in online judges using C++ and participating in competitive coding contests
- Achieved 11th Position, National Girls Programming Contest-2016, Bangladesh. (Tech Stack: C/C++, CodeBlocks)
- Social Chair, Computer Science Graduate Student Group (CSGSG) Council – 2024